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On a supposed Human Implement from the Gravel at Philadelphia.—Professor H. Carvill Lewis stated that through the kindness of Mr. John Sartain, the well-known engraver of this city, a supposed stone implement had come into his hands, which, from the circumstances in which it was found, becomes of great interest. In digging a pit below the cellar of the house No. 728 Sansom Street, Philadelphia, after passing through regularly stratified layers of gravel and sand, a loose, clean "water gravel" was reached at a depth of 24 feet from the surface of the street. The grade of the street is here about 35 feet above the mean level of the Delaware River, and the depth of the drift deposits, as shown by an artesian-well boring at the Continental Hotel, a few hundred feet distant, is 45 feet, gneiss rock being reached at that depth. The drift deposits consist of the usual alternations of sand and gravel with occasional streaks of clay, the whole being horizontally stratified.

The specimen was found at a depth of 24 feet in a loose gravel, where water flowed freely, and lay beneath a series of horizontally stratified layers of gravel and clay, which were entirely undisturbed, and were as originally deposited. Mr. Sartain saw the specimen taken out and testifies as to the accuracy of the above statement.

The supposed implement is an oblong rectangle in shape, 16½ inches in length, nearly 4 inches in width, and in thickness varying from ½ inch at the edge to 1½ inches at the centre. It is ground to a smooth cutting-edge at the two extremities. It is rectangular in section, the sides forming right-angles with the faces. The sides are parallel with each other, but the faces are undulating surfaces, on one of which is a prominent longitudinal ridge, an inch and a half in width.

Each end of the implement appears to have been smoothly ground to form a square, even cutting-edge, an equal amount of grinding having been done on either side. Both extremities are similar. The implement is as unusual in shape as it is in size. It is double the length of ordinary celts, and was possibly a lapstone of some kind.

The late Professor Haldeman, who examined the specimen, expressed great interest in it, and pronounced it undoubtedly of human workmanship.[1]

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[1] Mr. E. A. Barber, a well-known archæologist, reports, after a close examination of the implement, as follows:—"The peculiar marking or *pecking* shows it to be undoubtedly artificial. This pecking is characteristic of many pestles and other heavy stone implements found in this part of the country. There are certain small surfaces (the sides and part of the face) which have not been worked, but the greater part of the implement has been artificially pecked, and the ends have been ground down by abrasion, as may distinctly be seen. The character and use of the implement are not indicated by its shape, but there is no doubt at all as to its artificial workmanship."

Professor Lewis was not prepared to express such a positive opinion as to its artificial origin. The straight, parallel sides of the specimen, resemble the form of natural cleavage fragments of some sandstones and flagstones. Such cleavage fragments are frequently harder in the centre than along the edges, this being the result of a concretionary force, and if the specimen has been shaped by subsequent water action, the harder central portion would resist action and form the ridge already described. The regular bevelling at each extremity would, however, be a very unusual form to be produced by natural erosive forces.

The implement, if such it be, would be the first that has been discovered in the Philadelphia gravel, and would become of great interest in its bearing upon the antiquity of man on the Delaware. The implements found by Dr. Abbott in the gravel at Trenton are of a much more rude type, being closely allied in shape with the palæolithic implements of the river drift of several European localities. They are never ground down to an edge like the specimen now described, but are rudely chipped. The Trenton implements, moreover, are made from Triassic argillite, while this one is made from a compact yellowish-brown sandstone.

As the speaker had endeavored to show in a former communication,[1] the Trenton gravel is a post-glacial deposit made at the time of the final disappearance of glaciers from the headwaters of the Delaware, while the Philadelphia red gravel is somewhat older, having been formed during the glacial epoch at a time when this region was depressed 150–180 feet lower than its present level. Both gravels are true river gravels.

From the geographical position of the locality where the implement was found, it is probable that it belongs to the older of the two gravels. As, however, Professor Lewis had not seen the gravel at this place, judgment was reserved upon this point.

It would, indeed, be a curious fact if it were proved that an implement of neolithic type belonged to a gravel older than that which contained only palæolithic implements.

Should the specimen under consideration really belong to the gravel, and be proved to be artificial, it will carry back the antiquity of man to glacial times—an antiquity already assigned by numerous discoveries elsewhere. Unlike as this is to the palæolithic implements of Trenton, it is by no means the first neolithic implement reported from a river gravel.

Mr. John Ford[2] has discovered a polished stone axe in the gravel forming the outer bluff of the Mississippi River, near Alton, Ill., which is of great interest. This axe, now in the archæological collection of the Academy, was taken by Mr. Ford from a perpendicular face of gravel freshly cut and exposed by a road cutting; and, accompanied by a number of fossil land and fresh-water shells of Quaternary age, a bone of *Canis*, and a specimen of lignite, lay at a depth of twenty feet in the gravel, and at an elevation of 50 feet above the river. Mr. Ford states that "the wall referred to presented in every part a solid front, without fissure or crevice, everywhere hard and impenetrable except by pick or crowbar, and yet twenty feet under the surface, within this strong matrix deposited by water thousands of years ago, laid the evidence of the presence of the man of the period, a stone axe artistically made, and doubtless used for the purposes of battle." The implement thus found by Mr. Ford is more finely finished than that from the Philadelphia gravel. It is made of hard syenite.

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[1] Proc. Acad. Nat. Sc. (Min. and Geol. Section), Nov. 24, 1879.

[2] Proc. Acad. Nat. Sc. Phila., 1877, p. 305.

The implements said to occur in the auriferous gravels of California, described by Professor Whitney and others, and those from the loess of the Missouri Valley in Nebraska, discovered by Professor Aughey, are also of neolithic type, the California implements being as perfect as anything now made.

It may be, therefore, that in America rudeness of workmanship is not necessarily associated with great antiquity.

Opportunity is here taken to refer to a recent paper by Professor H W. Haynes,[1] entitled "Some indications of an early race of men in New England," in which the author describes some rough fragments of granite and quartzite found in various localities in Massachusetts, Vermont, and New Hampshire, which he considers to be rude forms of implements, more primitive than those of the Delaware gravels, and which are therefore to be regarded as relics of primeval man.

These objects are of various shapes, sometimes pointed, sometimes with sharp edges all around, and frequently sharp on one side and irregular on the other. These latter were regarded as implements adapted for being held in the hand for use in chopping or cutting. All these forms are of ruder type and coarser fabric than the implements of the Trenton gravel. They were found at localities where none of the ordinary traces of Indian occupation could be discovered, and the author infers from them the former existence in New England of a race of men different from and less advanced than the Indians.

With characteristic courtesy, Professor Haynes invited the speaker to make a personal examination of his full collection of these interesting objects.

A careful study of each specimen convinced Professor Lewis that the angularity of these rock fragments, while often resembling that of artificial forms, is in reality due to natural causes rather than to any human workmanship. Cleavage and frost-fracture and weathering planes appear to have been the sole agents in the production of the greater part of these forms. Upon most of the specimens examined, Professor Lewis was able to detect traces of the original cleavage or weathering planes parallel to certain sides of the fragment, which clearly indicated their mode of formation. Similar fragments occur in almost every portion of the country, their shape varying with the material of which they are formed. Professor Haynes himself states in the paper referred to, "Wherever it has been in my power to make the long and laborious search that is required, I have succeeded in finding them," etc. It is readily understood how a skilled archæologist, accustomed to find a use for every rude implement, would naturally find design also in the close imitations made by Nature.

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[1] Proc. Bost. Soc. Nat. Hist., xxi, p. 382, Feb. 1, 1882.

Among these objects of natural origin there were also a very few which bore traces of human handiwork, some of these being apparently "skin-scrapers." These latter often occur with the most highly finished Indian arrow-heads, and offer, therefore, no evidence of high antiquity. The cases where the same Indian tribe has manufactured implements of the finest workmanship at the same time with those of rudest make, each being intended for different uses, are so numerous as to need only to be mentioned.[1]

Returning finally to the supposed implement from the Philadelphia gravel, now brought before the attention of the Academy, Professor Lewis stated that he did not desire to urge any one interpretation of it, but merely to offer some particulars which might not otherwise see the light, and to show their meaning if verified hereafter. Whatever value might be attached to the circumstances of the discovery of this specimen or to its apparent artificial origin, it would at least serve to stimulate a further search for evidences of man in the gravels underlying the city.

An implement found in a thickly populated district, more especially as it occurred in a shifting water gravel, would always be open to suspicion, and at all events a single specimen is not sufficient upon which to base the broad conclusions which would otherwise be warranted.

Note on a Drilled Mall in the Haldeman Collection of Antiquities.—Mr. H. T. **Cresson** called attention to a large drilled mall or hammer-head of stone, from the Haldeman collection of antiquities. It was found at Peach Bottom, Lancaster County, Pennsylvania, in 1866, and weighs eight and three-quarter pounds. Most pre-historic hammer-heads or stone malls, consist of oval pebbles, small boulders of quartzite, granite, or other hard materials, which show modification by the hand of man, and have generally undergone more or less of pecking and polishing to bring them into a required shape. The mall exhibited did not possess any groove, but had a drilled hole for the insertion of a haft, which

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[1] At a meeting of the Academy held a week ago, Mr. Aubrey H. Smith presented two Indian implements picked up by himself on the shores of the Loyalsock Creek, Lycoming Co., Pa., where they lay side by side. One was a rudely chipped implement like those of the Trenton gravel, while the other was a delicately formed arrow-point.